

March 14, 2026

N ° 70

Cultivar *Semanal*®

Triple Resistance in Paraguay

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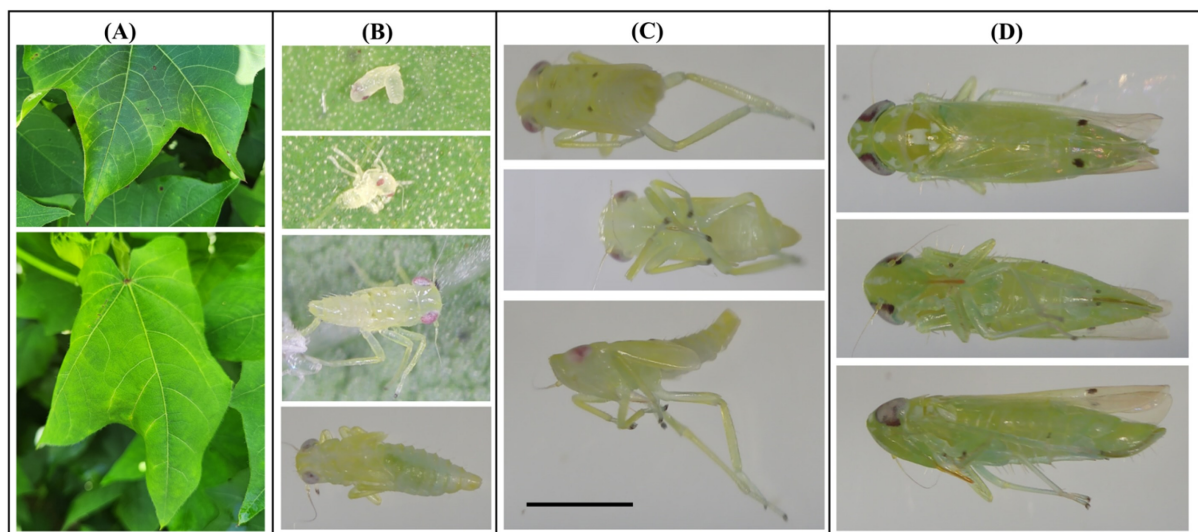
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Asian cotton bollworm receives molecular confirmation in the US.

DNA sequencing confirms the presence of *Amrasca biguttula* in a cotton field in Alabama.

13.03.2026 | 14:37 (UTC -3)

Schubert Peter, Cultivar Magazine



doi.org/10.3390/insects17030313

The cotton leafhopper *Amrasca biguttula* It received the first molecular confirmation in the United States. Researchers collected nymphs and adults in a cotton field in Macon County, Alabama, in August 2025.

DNA analysis confirmed the identity of the invasive species.

The insect causes severe damage to cotton and other crops in regions of Asia and Africa. Feeding occurs on the underside of leaves. Nymphs and adults suck sap and release salivary toxins. The attack causes "hopper burn," with yellowing, necrotic spots, leaf curling, and defoliation. Losses can exceed 60% in cotton and 50% in okra.

The team observed typical symptoms in plants at the EV Smith Research Center, an experimental area of ??Auburn University. Leaves exhibited discoloration and curling. Samples included nymphs at various stages and adults approximately 3 mm long. Adults showed two dark spots on

the forewings, a common diagnostic trait of the species.

Phylogenetic analysis

Confirmation was obtained through DNA barcoding of the mitochondrial COI gene. The sequence showed over 99% identity with samples recorded in India, China, and Pakistan. Phylogenetic analysis placed the Alabama isolate within the group of *Amrasca biguttula* with full statistical support.

Previous reports indicated the presence of the pest in the Western Hemisphere based on morphology, including a record in Puerto Rico in 2023. However, molecular validation in North American territory was

lacking.

Limited impact

During the 2025 harvest, researchers did not observe significant losses in the sampled plot. The still low population and detection after the fruiting stage explain the limited impact. Insecticide application occurred after collection to reduce the risk of damage.

Precise identification gains importance due to the similarity with other leafhoppers of the Empoascini tribe, such as *Empoasca fabae*. Nymphs exhibit few diagnostic characteristics. Molecular diagnosis increases reliability in monitoring and management programs.

Molecular registration provides genetic reference for plant health surveillance. Researchers highlight the need for regional monitoring and studies on integrated management in cotton systems in the United States.

Further information at
doi.org/10.3390/insects17030313

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Research advances in the development of cold-tolerant avocados.

Breeding lines withstand temperatures as low as -8°C and expand cultivation potential in northern Florida.

13.03.2026 | 13:52 (UTC -3)

Cultivar Magazine, based on information from Luz Bahder



Photo: Dale Boettcher, UF-IFAS

The breeding program at the Institute of Food and Agricultural Sciences (UF/IFAS) at the University of Florida, United States, is making progress in developing cold-tolerant avocados. Experimental lines can withstand temperatures between -8°C and -7°C. This result expands cultivation prospects in north-central Florida.

A strong cold wave in January 2026 served as a natural test for the materials under evaluation. The frost allowed for the identification of distinct levels of tolerance among the plants. Some of the trees retained green leaves after the weather event.

The work is led by associate professor of horticultural sciences José Chaparro. The program's objective involves the

production of cultivars adapted to the region's winter, with a commercial standard of fruit quality.

Traditional commercial varieties exhibit low cold tolerance. The 'Hass' avocado, a global market benchmark, suffers damage at low temperatures. Antillean varieties grown in South Florida show damage near 0°C. Guatemalan-Mexican hybrids used in California face problems below -4°C.

Improvement program

The breeding program began operations in 2005. The strategy includes cultivating seedlings in the field during the winter. Direct exposure to natural events allows for the selection of more tolerant

genotypes.

Over generations, the program has recorded larger fruits, higher oil content, and greater resistance to anthracnose, a fungal disease responsible for fruit rot. The team is seeking further progress in peel thickness and reduction of cracking during summer rains.

Current selections show characteristics similar to the Mexican group. Chaparro seeks material with attributes similar to 'Hass', including creamy pulp, high oil content, and dark skin during ripening.

Trials with growers are already underway in different regions of Florida. The group is identifying trees with greater cold tolerance. Future crossbreeding should combine this attribute with superior fruit

quality.

Researchers point to a productive opportunity for the state. Water limitations affect producing areas in the western United States. Florida has available land and a reliable water supply. Advances in cold tolerance could expand the avocado cultivation frontier.

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2025/26 Harvest: Brazil is expected to reach 353,4 million tons.

This volume represents a 0,3% increase compared to the previous harvest.

13.03.2026 | 10:32 (UTC -3)

Cultivar Magazine, based on information from Conab



Brazilian grain production in the 2025/26 harvest is expected to reach 353,4 million tons, according to the sixth survey released by the National Supply Company

(Conab). This volume represents a 0,3% increase compared to the previous harvest, equivalent to an increase of approximately 1,2 million tons.

The cultivated area is also expanding. The estimate is 83,2 million hectares, an increase of 1,7% compared to the previous cycle, which corresponds to the incorporation of approximately 1,4 million hectares into the production system.

By the end of February, approximately 66,7 million hectares had already been sown, equivalent to 80% of the total planned area. This figure includes first-crop plantings and approximately 65% ??of the area destined for second-crop corn, whose sowing is still underway in the main producing regions.

Soybeans support growth.

Soybeans remain the main driver of Brazilian agricultural production. Conab estimates that the oilseed will reach 177,8 million tons. This would represent a new national record.

The area cultivated with the crop is expected to reach 48,4 million hectares, a 2,3% increase compared to the previous harvest. Projected production represents a 3,7% increase, or 6,4 million tons, driven mainly by favorable weather conditions observed during crop development.

By the end of February, the soybean harvest had reached 41,7% of the planted

area, a pace considered within the average of the last five years.

Corn maintains a large share.

Total corn production, considering all three harvests, is estimated at 138,3 million tons, a volume 2% lower than that recorded in the previous cycle.

In the first harvest, the cultivated area is expected to reach 4,1 million hectares, with an estimated production of 27,4 million tons, a 9,7% increase compared to the previous harvest.

The second crop is expected to occupy 17,8 million hectares, with a projected production of 108,4 million tons.

The third crop, with planting scheduled between April and July, is expected to occupy 587,8 hectares, with an estimated production of 2,5 million tons.

Reduction: rice and beans

Among the main food crops, rice shows a significant decline. The cultivated area is estimated at 1,5 million hectares, a 12,2% reduction compared to the previous harvest.

Production is expected to reach 11,2 million tons, a decrease of 12,4%, mainly reflecting the reduction in cultivated area under rainfed systems.

In the case of beans, the total production of the three harvests is estimated at 2,9 million tons, a 4,7% reduction compared to the previous cycle. The first harvest shows an 11,2% decrease in planted area, totaling 807,2 hectares, with an estimated production of 954 tons.

Cotton has a slight reduction.

For cotton, the estimate is for a 3,5% reduction in planted area, which should be close to 2 million hectares.

Cotton production is projected at 3,8 million tons. At the time of Conab's assessment, approximately 67,7% of the crops were in vegetative development,

while 20,6% showed boll formation and 10,1% were in flowering.

TABELA 1 - COMPARATIVO DE ÁREA, PRODUTIVIDADE E PRODUÇÃO POR PRODUTO

Brasil	Estimativa da produção de grãos			Safras 2024/25 e 2025/26					
Produto	ÁREA (Em mil ha)			PRODUTIVIDADE (Em kg/ha)			PRODUÇÃO (Em mil t)		
	Safra 24/25	Safra 25/26	VAR. %	Safra 24/25	Safra 25/26	VAR. %	Safra 24/25	Safra 25/26	VAR. %
	(a)	(b)	(b/a)	(c)	(d)	(d/c)	(e)	(f)	(f/e)
ALGODÃO - CAROÇO (1)	2.085,6	2.013,6	(3,5)	2.773	2.673	(3,6)	5.782,8	5.382,3	(6,9)
ALGODÃO - PLUMA	2.085,6	2.013,6	(3,5)	1.954	1.885	(3,6)	4.076,1	3.795,1	(6,9)
AMENDOIM TOTAL	280,4	281,6	0,4	4.136	4.280	3,5	1.159,7	1.205,1	3,9
Amendoim 1ª Safra	273,1	274,3	0,4	4.202	4.350	3,5	1.147,6	1.193,1	4,0
Amendoim 2ª Safra	7,3	7,3	-	1.662	1.668	0,3	12,1	12,0	(0,8)
ARROZ	1.763,9	1.548,9	(12,2)	7.233	7.216	(0,2)	12.757,7	11.177,4	(12,4)
Arroz sequeiro	394,6	284,2	(28,0)	2.935	2.757	(6,0)	1.158,2	783,7	(32,3)
Arroz irrigado	1.369,3	1.264,7	(7,6)	8.471	8.218	(3,0)	11.599,5	10.393,7	(10,4)
FEIJÃO TOTAL	2.693,0	2.580,6	(4,2)	1.136	1.130	(0,6)	3.059,9	2.916,1	(4,7)
FEIJÃO 1ª SAFRA	908,5	807,2	(11,2)	1.170	1.182	1,0	1.062,7	954,0	(10,2)
Cores	347,3	333,1	(4,1)	1.707	1.771	3,8	592,8	590,0	(0,5)
Preto	169,0	119,7	(29,2)	1.953	1.767	(9,5)	330,2	211,5	(35,9)
Caupi	392,2	354,4	(9,6)	356	430	20,8	139,7	152,5	9,2
FEIJÃO 2ª SAFRA	1.400,1	1.346,5	(3,8)	953	935	(1,8)	1.333,6	1.259,5	(5,6)
Cores	294,6	301,7	2,4	1.499	1.502	0,2	441,6	453,0	2,6
Preto	286,6	230,3	(19,6)	1.616	1.652	2,2	463,2	380,5	(17,9)
Caupi	818,9	814,5	(0,5)	524	523	(0,2)	428,9	425,9	(0,7)
FEIJÃO 3ª SAFRA	384,4	426,9	11,1	1.726	1.646	(4,7)	663,7	702,6	5,9
Cores	326,5	361,0	10,6	1.881	1.802	(4,2)	614,2	650,6	5,9
Preto	14,1	14,1	-	1.268	1.145	(9,7)	17,9	16,2	(9,5)
Caupi	43,8	51,8	18,3	721	695	(3,7)	31,6	36,0	13,9
GERGELIM	608,0	611,0	0,5	657	656	(0,1)	399,4	401,1	0,4
GIRASSOL	61,9	63,8	3,1	1.622	1.616	(0,4)	100,4	103,0	2,6
MAMONA	69,6	76,1	9,3	1.437	1.936	34,7	100,0	147,3	47,3
MILHO TOTAL	21.838,0	22.408,2	2,6	6.464	6.171	(4,5)	141.157,6	138.270,3	(2,0)
Milho 1ª Safra	3.772,6	4.058,9	7,6	6.610	6.738	1,9	24.935,8	27.350,1	9,7
Milho 2ª Safra	17.430,3	17.761,5	1,9	6.496	6.105	(6,0)	113.228,4	108.434,8	(4,2)
Milho 3ª Safra	635,1	587,8	(7,4)	4.714	4.228	(10,3)	2.993,6	2.485,3	(17,0)
SOJA	47.346,1	48.434,8	2,3	3.622	3.672	1,4	171.480,5	177.846,7	3,7
SORGO	1.632,0	1.870,3	14,6	3.739	3.676	(1,7)	6.102,2	6.876,0	12,7
SUBTOTAL	78.378,5	79.888,9	1,9	4.365	4.310	(1,3)	342.100,2	344.325,3	0,7

Culturas de inverno	ÁREA (Em mil ha)			PRODUTIVIDADE (Em kg/ha)			PRODUÇÃO (Em mil t)		
	2025	2026	VAR. %	2025	2026	VAR. %	2025	2026	VAR. %
	(a)	(b)	(b/a)	(c)	(d)	(d/c)	(e)	(f)	(f/e)
AVEIA	545,8	509,0	(6,7)	2.368	2.253	(4,9)	1.292,3	1.146,7	(11,3)
CANOLA	211,9	275,7	30,1	1.627	1.620	(0,4)	344,8	446,5	29,5
CENTEIO	2,1	2,1	-	2.381	2.238	(6,0)	5,0	4,7	(6,0)
CEVADA	139,2	149,9	7,7	4.358	3.898	(10,6)	606,6	584,3	(3,7)
TRIGO	2.445,9	2.318,3	(5,2)	3.219	2.978	(7,5)	7.873,4	6.904,8	(12,3)
TRITICALE	11,4	11,4	-	3.211	2.947	(8,2)	36,6	33,6	(8,2)
SUBTOTAL	3.356,3	3.266,4	(2,7)	3.027	2.792	(7,8)	10.158,7	9.120,6	(10,2)
BRASIL (2)	81.734,8	83.155,3	1,7	4.310	4.250	(1,4)	352.258,9	353.445,9	0,3

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Agricultural Market - March 13, 2026

War in the Middle East puts pressure on oil and sustains grain prices.

13.03.2026 | 10:24 (UTC -3)

Vlamir Brandalitze - @brandalitzeconsulting



The war involving Iran has heightened tensions in the international market and boosted agricultural commodities. Attacks

on ships in the Strait of Hormuz triggered a strong reaction in oil prices. WTI surpassed \$95 per barrel. Brent exceeded \$100. This movement is supporting soybeans, corn, and wheat in Chicago.

Soybean prices reached levels not seen in over two years. Contracts hit US\$12,50 per bushel in July. Part of the market hedged at this level. The price increase is due to factors external to the soybean complex. Expensive oil is boosting vegetable oil prices. A harsh winter in the northern hemisphere is sustaining demand for soybean meal. Near and intermediate contracts are maintaining prices above US\$12 per bushel.

The Brazilian market is not following suit with the same intensity. Premiums at ports

are falling to their lowest levels of the year. Buyers are indicating values ??below -50 points in short positions. Freight costs are also reducing margins in the interior.

Diesel prices vary from R\$ 8 to R\$ 10 per liter in several regions. At the beginning of the month, prices were between R\$ 5 and R\$ 6,50.

Soybean harvesting in Brazil has reached 57% of the area. Mato Grosso leads with 92%. Paraná and Mato Grosso do Sul register 58%. Goiás reaches 55%. Bahia accounts for 40%. Rondônia reaches 65%. In Rio Grande do Sul, work has begun with approximately 1% of the area.

The marketing of the new harvest is progressing at a slower pace than historically. Deals involve less than 40% of

production. During the same period last year, the rate exceeded 48%. The historical average is around 47%. The country harvested approximately 171,5 million tons.

Another obstacle has emerged in the ports. Sanitary inspections have become stricter following new demands from China. The Asian country does not accept mixing with seeds of other species or invasive plants. Contaminated cargo is facing blockades. There are ships detained at their destinations. Some trading companies have suspended purchases until the flow normalizes.

Corn situation

In the corn market, Chicago also saw price increases. Short-term contracts rose more than 4%. The July contract reached US\$5,10 per bushel. The market is monitoring strong demand and a possible reduction in planted area in the United States. Projections indicate a cut of approximately 2 million hectares in the next planting season.

In Brazil, the first corn crop harvest has reached approximately 55%. The planting of the second crop has reached 92% of the area. The pace remains below the historical average. A significant portion is still being planted outside the ideal window.

Wheat situation

Wheat is also gaining external support. Prices in Chicago are exceeding US\$6 per bushel in short-term positions. Longer-term contracts are approaching US\$6,50. This price increase raises import costs for Brazil. Projections indicate wheat prices above R\$1.500 per ton in the domestic market.

Rice situation

Rice harvest in Rio Grande do Sul begins with good grain quality. Some areas show yields of 60% to 62% whole grains.

Producers are holding back supply. Prices indicate R\$ 55 to R\$ 57 in the Western Border region. Regions near the port reach up to R\$ 63 per sack. Logistical costs are

putting pressure on consumer prices.

Bean situation

For beans, premium lots reach R\$330 to R\$360 per sack. Commercial carioca beans range from R\$300 to R\$335. Black beans fluctuate between R\$180 and R\$200 depending on the market. Retailers have already incorporated price adjustments following the increase recorded in February.

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CNH has new global technology communications leadership.

Erin Rinehart takes over the role after leading strategic marketing.

13.03.2026 | 09:59 (UTC -3)

Cultivar Magazine

The CNH logo is displayed in a large, bold, black sans-serif font.

CNH has appointed Erin Rinehart as "Head of Global Technology

Communications." She previously served as director of strategic marketing for precision technology within the company.

In her new role, Erin leads global technology communications. The focus includes aligning messaging with the company's precision agriculture business objectives. She also drives positioning and value communication strategies for CNH's brand technology portfolio.

Prior to her new role, she led strategic marketing for precision technology since March 2024. The executive was involved in defining positioning, brand governance, and global product launch strategies.

Before joining CNH, Erin worked at Raven Industries. There, she held positions as director of strategic marketing, marketing

manager, and corporate communications specialist.

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Overexpression of ABC genes reduces the effectiveness of emamectin.

Study identifies carriers associated with *Spodoptera frugiperda* resistance and warns about the need for insecticide rotation.

13.03.2026 | 09:15 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: Natalie Hummel, Louisiana State University

A fall armyworm (*Spodoptera frugiperda*)

Moderate levels of resistance to the insecticide emamectin benzoate have been observed in field populations analyzed in China. Recent research has identified overexpression of genes from the ABC family as an important factor in this process.

The study evaluated six populations collected from different Chinese provinces. Toxicological assays indicated resistance ratios between 19,05 and 67,14 times that of the susceptible strain. The highest value occurred in the GDZJ population.

Laboratory selection further increased tolerance. After ten generations under insecticide pressure, the median lethal concentration increased from 0,021 mg/L

to 5,37 mg/L. The resulting index reached 255,71 times higher than the susceptible strain. This level characterizes high resistance.

Cross-resistance

Further tests analyzed cross-resistance with other active ingredients. The resistant strain also showed strong resistance to abamectin, with a ratio of 22,45. The study recorded low resistance to indoxacarb.

Lufenuron, chlorantraniliprole, deltamethrin, and cyantraniliprole maintained similar efficacy to the susceptible strain.

The investigation sought molecular mechanisms associated with the

phenomenon. Transcriptome sequencing identified 3.770 differentially expressed genes. Among them, 2.108 showed increased expression in the resistant strain. Many of these sequences are related to transmembrane transport.

Among candidate genes, four transporters from the ABC family showed high expression in resistant populations: ABCD2, ABCC2, ABCG20a, and ABCB1. The analysis also found a positive correlation between expression level and LC50 value for emamectin.

RNA interference assays confirmed the functional role of these genes. Individual silencing reduced expression between 45% and 68%. After treatment with emamectin, larval mortality increased

between 15,8% and 18%. Simultaneous silencing of all four genes increased mortality by 28,1%.

Tests with verapamil, an ABC transporter inhibitor, produced a similar effect. The compound increased the larvae's susceptibility to the insecticide by up to three times. The result indicates the participation of these transporters in the detoxification or expulsion of the compound from the cell.

Direct interaction

Molecular modeling also indicated a direct interaction between emamectin benzoate and the analyzed ABC proteins. Simulations showed hydrogen bonding

and hydrophobic interactions at the protein binding sites. This pattern reinforces the role of these transporters in the transport of the insecticide or its metabolites.

The results indicate a significant role of metabolic mechanisms in increasing pest tolerance. The research also confirms the multifactorial nature of resistance in *Spodoptera frugiperda*.

More information at
doi.org/10.1016/j.pestbp.2026.106980

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Loss of the queen activates the dopaminergic pathway in worker bees.

Study identifies increased brain dopamine and hormonal activation during ovarian development in *Apis mellifera*.

12.03.2026 | 14:06 (UTC -3)

Schubert Peter, Cultivar Magazine

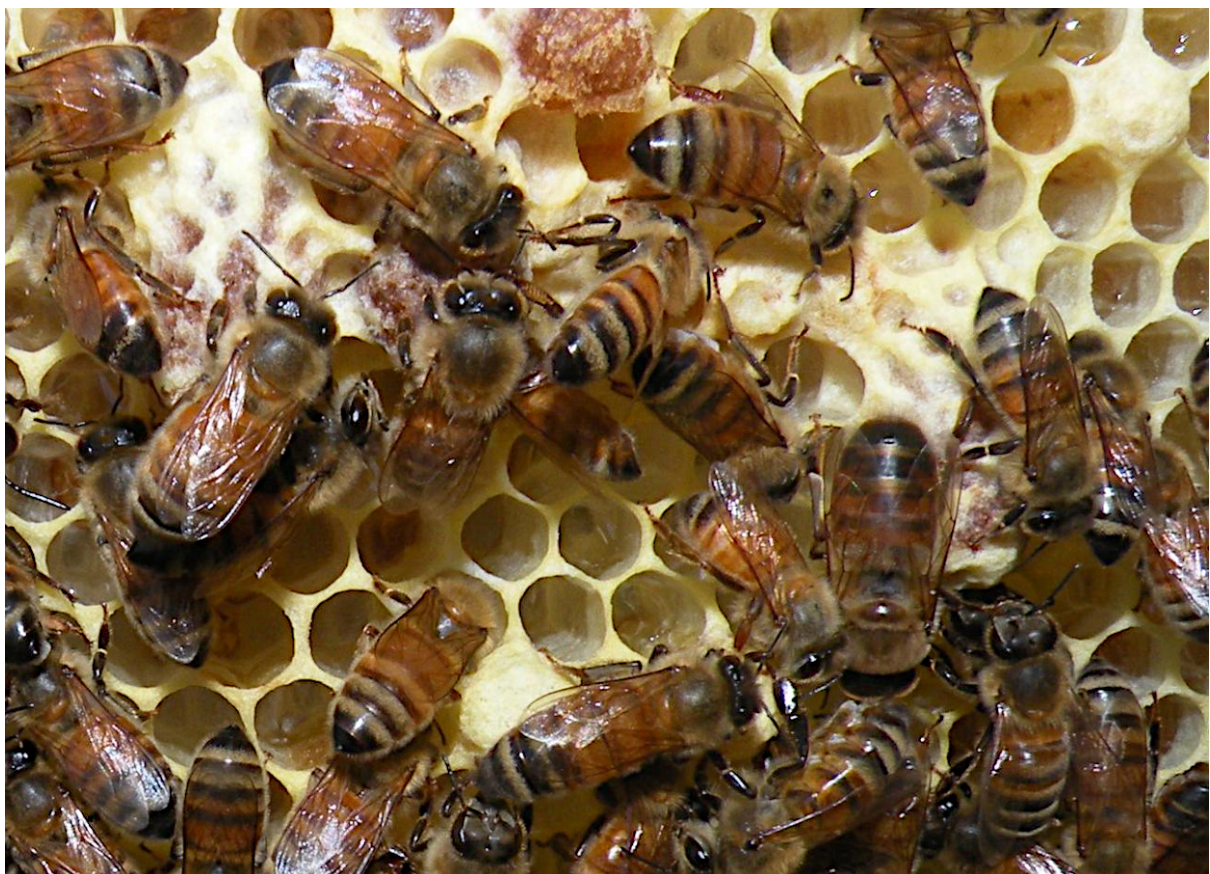


Photo: Jessica Louque, Smithers Viscient

The loss of the queen induces neuroendocrine changes in worker bees. *Apis mellifera* and promotes ovarian activation. Research has identified a progressive increase in dopamine in the brain, alterations in receptors in the ovary, and greater activity of hormonal pathways associated with reproduction. Results indicate integration between neural and endocrine signaling during the onset of egg laying by worker bees.

The study evaluated worker bees kept in colonies with and without queens.

Researchers collected individuals after 14 days and classified them into three ovarian stages: inactive, partially active, and fully active. Samples allowed for the quantification of brain dopamine and

analysis of gene expression related to the synthesis, transport, and metabolism of this neurotransmitter, as well as genes linked to juvenile hormones and the 20-hydroxyecdysone pathway.

Elevated dopamine

Results indicated an increase in cerebral dopamine during the progression of ovarian development. Worker bees with fully active ovaries showed levels 1,50 times higher compared to the intermediate stage and 1,11 times higher compared to the initial stage. No difference was observed between worker bees with inactive ovaries in colonies with or without a queen.

Molecular analyses showed increased expression of genes involved in the production and regulation of dopamine in the brain. These include tyrosine hydroxylase (Amth), dopa decarboxylase (Amddc), dopamine transporter (Amdat), and arylalkylamine N-acetyltransferase (Amnat). These genes showed higher expression in worker bees with active ovaries.

Dopamine receptors exhibited a distinct pattern between the brain and the ovary. In the brain, there was no relevant variation between ovarian stages. In the ovary, there was a reorganization in sensitivity to the neurotransmitter. The Amdop1 receptor showed an increase during ovarian activation. The Amdop3 receptor

showed a reduction with the advancement of the reproductive process.

Hormonal pathways

Research also detected increased activity in hormonal pathways linked to reproduction. Genes associated with the juvenile hormone, such as JHAMT, MFE, Met, and Kr-h1, showed higher expression in worker bees with active ovaries.

Markers of the 20-hydroxyecdysone pathway—Neverland, Shadow, EcR, and E75—also increased as ovarian development progressed.

Some hormonal genes showed elevation even in worker bees without active ovaries within queenless colonies. The pattern

suggests early endocrine preparation after the queen's absence. This process may precede the morphological changes observed in the ovary.

The set of results indicates dopaminergic remodeling associated with the reproductive activation of worker bees. Changes in neural and hormonal signaling form an integrated network linked to ovarian development in the absence of the queen.

Further information at
doi.org/10.3390/insects17030308

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Brazilian executive takes on global digital leadership role at Syngenta.

Gustavo Almeida leads the company's global commercial platforms and technological architecture.

12.03.2026 | 10:47 (UTC -3)

Cultivar Magazine



Syngenta has appointed Brazilian executive Gustavo Almeida as "Global Head of Commercial Digital Technologies." The role involves leading digital platforms, engineering, and architectural vision for the company's commercial business. The position is part of the global structure based in Basel, Switzerland.

Almeida leads the strategic definition of commercial technology platforms. The role includes digital transformation and technological modernization initiatives. The executive also leads the creation and expansion of engineering centers focused on the commercial business. The agenda includes the adoption of modern architectures and emerging technologies, such as artificial intelligence.

The professional has been with the company for 15 years. Prior to this new role, they led the IT & Digital area in Brazil. This team comprised approximately 130 professionals. Their work integrated digital technologies and corporate processes to support the growth of the Brazilian operation and expand digital offerings for rural producers.

Between 2018 and 2024, Almeida led the IT area for Latin America and Brazil. His management unified regional technological governance. The period included infrastructure projects and systems modernization.

Prior to Syngenta, the executive worked at Nestlé for over eight years on projects involving systems integration, supply chain

management, and SAP implementation. His career began at Monsanto, where he participated in the national implementation of the SAP system for its seed and chemical businesses.

Almeida holds a degree in Chemical Engineering from the Federal University of São Carlos. The executive completed an MBA in Business and Project Management from the Fundação Instituto de Administração. He also participated in executive programs at MIT Sloan School of Management, Purdue University, and London Business School.

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SLC Agrícola reports record revenue of R\$ 8,6 billion in 2025.

The company plans to continue expanding productivity and irrigated area.

12.03.2026 | 08:12 (UTC -3)

Schubert Peter, Cultivar Magazine



SLC Agrícola ended 2025 with record results, driven by increased productivity,

expansion of cultivated area, and growth in sales volume. The company recorded record net revenue of R\$ 8,6 billion, a 23,7% increase compared to 2024, while net profit reached R\$ 565,2 million, a 17,3% increase in the period, according to information presented to shareholders.

The performance was mainly driven by a significant increase in sales volume, which reached 3,59 million tons, a 42,3% increase compared to the previous year.

Among the operational highlights of the year is the second corn crop, which achieved a record productivity of 8.304 kg per hectare, consolidating the best result in the company's history for this crop.

Growth and productivity

The company's strong operational performance was also reflected in the key crops of its portfolio.

In the 2024/25 crop season, the average soybean yield reached 3.961 kg/ha, a result 21,4% higher than the previous cycle and about 9,4% above the national average, according to data compared with estimates from Conab.

Corn, on the other hand, showed significant growth in productivity and volume. Commercial production reached 1,21 million tons, an 84% increase compared to 2024, benefiting from higher prices and strong domestic demand.

This performance contributed to improved crop profitability. The gross margin for soybeans, for example, rose to 35,6% in 2025, compared to 19,4% the previous year, driven mainly by the reduction in unit cost resulting from higher productivity.

Expansion strategy

Another decisive factor in the company's growth was its expansion strategy through mergers and acquisitions (M&A).

Throughout 2025, SLC Agrícola carried out five strategic operations, significantly expanding its production base and strengthening its growth model based on leased areas, known as asset light.

Among the main movements are:

- Acquisition of Sierentz Agro Brasil for US\$129 million, adding approximately 96 hectares in the states of Maranhão, Piauí, and Pará;
- Purchase of land from Agrícola Xingu, in Bahia and Minas Gerais, for R\$ 913 million, adding 46 hectares to the portfolio;
- Acquisition of Mitsui's stake in the SLC-MIT joint venture, adding 27 hectares to the planted area;
- Partnership with investment funds managed by BTG Pactual, focused on expanding irrigation projects.

With these moves, the company expanded its cultivated area by approximately 100 hectares by 2025, reinforcing its strategy

for growing its agricultural operations.

Expansion of planted area

For the 2025/26 crop season, the company estimates reaching 837,2 hectares planted, an increase of 13,8% compared to the previous cycle.

Soybeans will continue to be the main crop, covering approximately 424,7 hectares, followed by second-crop corn and cotton.

According to the company, part of this growth is directly related to the areas incorporated through the acquisition of Sierentz Agro Brasil.

Seeds and diversification

The seed segment also showed expansion.

The total volume distributed reached 61.401 big bags, a growth of 12,6% compared to the previous year, including sales to third parties, internal operations, and the company's own consumption on its farms.

With this performance, SLC Sementes increased its market share in the soybean seed market to 3%, an increase of 0,3 percentage points compared to the previous year.

Exports and the international market

Another significant milestone was the record for cotton exports, which totaled 369 tons shipped in 2025, consolidating the company's competitiveness in the global fiber market.

Even in an international environment marked by price volatility, the company maintained robust margins and expanded its presence in international trade.

Financial structure and dividends

The company's adjusted EBITDA reached R\$ 2,6 billion, with a margin of 31,2%,

reflecting the company's operational growth and productive efficiency.

Adjusted net debt at the end of the fiscal year was R\$ 5,2 billion, maintaining the net debt/EBITDA ratio at 1,97 times, a level considered comfortable for the sector.

Regarding shareholder remuneration, the company distributed R\$ 400 million in dividends and interest on equity, equivalent to R\$ 0,91 per share, with a dividend yield of 5,6%.

perspectives

According to the company's CEO, Aurélio Pavinato, 2025 was a strategic year for consolidating the company's growth.

The company intends to continue expanding productivity and irrigated area, expecting to exceed 50 hectares of irrigated land in the coming years, strengthening productive stability and increasing the value of agricultural land.

(R\$ mil)	2024	2025	AH	4T24	4T25	AH
Receita líquida	6.915.764	8.553.147	23,7%	1.975.375	2.272.265	15,0%
Resultado bruto	2.307.726	2.928.929	26,9%	551.361	574.275	4,2%
Margem bruta	33,4%	34,2%	0,8p.p.	27,9%	25,3%	-2,6p.p.
Resultado operacional	1.513.149	1.812.542	19,8%	266.514	209.162	-21,5%
Margem operacional	21,9%	21,2%	-0,7p.p.	13,5%	9,2%	-4,3p.p.
Lucro líquido	481.723	565.213	17,3%	(51.350)	(70.799)	37,9%
Margem líquida	7,0%	6,6%	-0,4p.p.	-2,6%	-3,1%	-0,5p.p.
EBITDA ajustado	2.036.617	2.664.716	30,8%	611.156	633.110	3,6%
Margem EBITDA ajustado	29,4%	31,2%	1,8p.p.	30,9%	27,9%	-3,0p.p.
Fluxo de caixa livre	34.298	(929.414)	n.m.	625.551	549.063	-12,2%

Vendas (toneladas)

Culturas	4T24	4T25	Δ%
Algodão	122.492	120.595	-1,5%
Caroço de algodão	167.677	145.433	-13,3%
Soja	95.636	99.121	3,6%
Milho	203.901	438.948	115,3%
Gado (cabeça)	13.713	26.466	93,0%

Resultado bruto unitário por cultura (R\$/ton)

Culturas	4T24	4T25	Δ%
Algodão	3.844	3.356	-12,7%
Caroço de algodão	188	375	99,1%
Soja	415	996	140,0%
Milho	224	352	57,1%
Gado (R\$/cabeça)	590	297	-49,7%

Posição de hedge – câmbio – Release 3T25 x Release 4T25

Culturas	Release 3T25			Release 4T25			Variação		
SOJA	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	99,7	34,9	-	100,0	63,5	2,3	0,3	28,6	2,3
R\$/USD	5,6244	5,9232	-	5,6383	5,7700	5,4571	-	-0,1532	5,4571
Compromissos %	-	29,4	-	-	12,0	44,7	-	-17,4	44,7
ALGODÃO	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	92,9	25,9	-	99,5	68,1	-	6,6	42,2	-
R\$/USD	6,0990	6,3998	-	6,0811	6,1005	-	-0,0179	-0,2993	-
Compromissos %	-	23,6	-	-	5,5	34,1	-	-18,1	34,1
MILHO	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	98,7	40,0	-	100,0	61,9	3,5	1,3	21,9	3,5
R\$/USD	5,7572	5,7842	-	5,7430	5,7298	5,4571	-0,0142	-0,0544	5,4571
Compromissos %	-	19,4	-	-	3,2	33,6	-	-16,2	33,6

Posição de hedge – commodity – Release 3T25 x Release 4T25

Culturas	Release 3T25			Release 4T25			Variação		
SOJA	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	99,7	48,4	0,0	100,0	67,0	11,9	0,3	18,6	11,9
USD/bu	11,48	11,02	0	11,48	11,17	11,67	-	0,15	11,67
Compromissos %	-	11,8	0,0	-	7,8	18,1	-	-4,0	18,1
ALGODÃO	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	63,0	27,2%	0,0	99,0	80,7	-	36,0	53,5%	-
USD\$/lb	76,27	74,17	0,00	73,50	73,51	-	-2,77	-0,66	-
Compromissos %	-	0,0	0,0	-	-	-	-	0,0%	-
MILHO	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27	2024/25	2025/26	2026/27
%	57,1	6,5	-	58,8	15,1	-	1,7	8,6	-
R\$/saca	51,28	54,44	-	51,48	58,76	-	0,20	4,32	-
%	39,3	12,1	-	41,2	28,7	-	1,9	16,6	-
USD/saca	8,50	8,35	-	8,64	8,91	-	0,14	0,56	-
Compromissos %	-	-	-	-	-	-	-	-	-

Insumos – safra 2025/26 - % comprado

Fertilizantes/Defensivos%	3T25	4T25	Δp.p.
Nitrogenados	96	100	4
Cloreto de Potássio	100	100	-
Fosfatados	100	100	-
Defensivos	96	100	4

Insumos – safra 2026/27 - % comprado

Fertilizantes/Defensivos%	3T25	4T25	Δp.p.
Nitrogenados	-	-	-
Cloreto de Potássio	-	-	-
Fosfatados	-	97	97
Defensivos	-	16	16

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Delayed sowing increases critical density of winter wheat.

Global synthesis shows an increase in the critical seed rate and partial compensation for losses with higher density.

12.03.2026 | 07:28 (UTC -3)

Schubert Peter, Cultivar Magazine



Delayed sowing reduces winter wheat productivity and increases the seeding density required to achieve maximum yield. A global analysis of 40 experiments showed an increase in the critical seed rate from 292 to as many as 463 seeds per square meter when sowing occurs 30 days after the recommended time.

The study compiled 658 average yields from experiments conducted in North America, Asia, and Europe. Productivity ranged from 0,3 to 10,5 Mg per hectare.

Seeding and density

The synthesis evaluated the interaction between sowing date and sowing density in winter wheat (*Triticum aestivum*)

objective included identifying additive, synergistic, or antagonistic relationships between the factors and estimating the critical seed density to achieve 95% of the maximum yield.

Results indicated a predominance of negative additive responses. This pattern occurred in 40% of the combinations evaluated between delayed sowing and increased density. Negative antagonistic relationships appeared in 25% of cases.

A negative additive relationship indicates an absence of interaction between the factors. In this scenario, the usual seeding density is already approaching the critical density needed to maximize yield under delayed planting conditions.

Negative antagonistic relationships indicate partial compensation for the effect of the delay. Increased density raises productivity, but does not fully recover the losses caused by late sowing.

The database compiled 169 combinations of delayed sowing and density. Most showed delayed sowing as the main determining factor in the productive response.

Progressive increase in density

Michaelis–Menten type models estimated a progressive increase in critical density as the delay increases. The critical rate reached 292 seeds per square meter on

the normal sowing date. The value rose to 455 seeds per square meter with a delay of 10 to 30 days and reached 463 seeds per square meter with a delay greater than 30 days.

The increase in density raised aboveground biomass, number of ears, and number of grains per area. The weight of one thousand grains remained stable in response to variations in density.

The reduction in yield due to delayed planting was mainly due to a smaller number of ears and lower biomass production. Higher density increased the number of ears per area, but reduced the number of grains per ear, demonstrating a trade-off between yield components.

Further information can be found at
doi.org/10.1002/csc2.70252

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Mycorrhizal fungi use RNA to stimulate root colonization.

Study reveals molecular communication between fungus and plant that promotes symbiosis.

11.03.2026 | 17:26 (UTC -3)

Schubert Peter, Cultivar Magazine

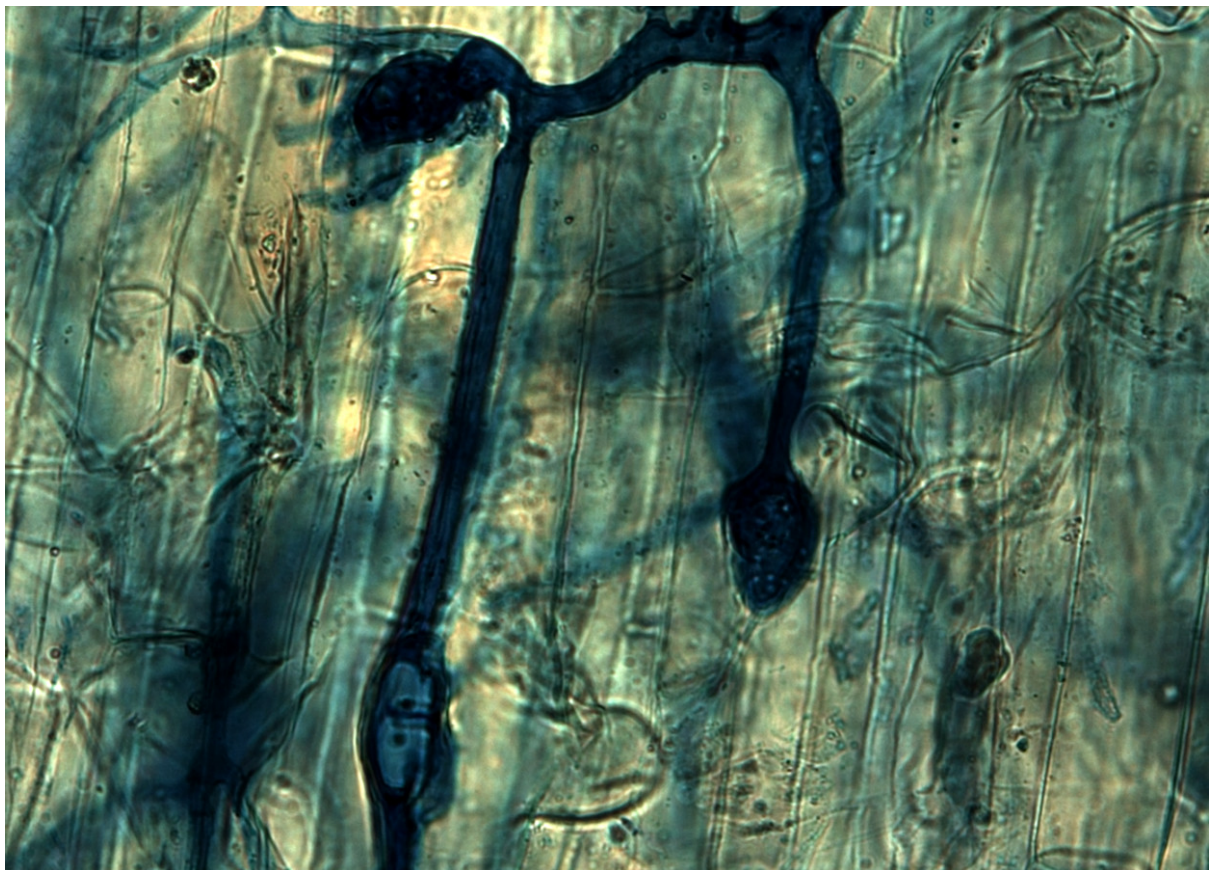


Photo: Mylène Durant - CC BY-SA 4.0

Researchers have identified a molecular mechanism that enhances the formation of arbuscular mycorrhizae in plant roots. The fungus *Rhizophagus irregularis* It transfers small RNA molecules to plant cells. This genetic material alters the activity of plant genes and promotes root colonization.

The research demonstrates the occurrence of RNA interference between different organisms, known as cross-kingdom RNA interference. The process has already appeared in interactions between plants and pathogens. Now the data indicate its role in a beneficial symbiosis as well.

Arbuscular mycorrhizae emerged approximately 450 million years ago. The system involves fungi from the

Glomeromycotina group. These microorganisms colonize the roots of approximately 80% of terrestrial plants. This association enhances plant nutrition and improves crop performance.

Fungi capture mineral nutrients from the soil. Hyphae transport these elements to the root. Highly branched structures called arbuscules release the nutrients into the cells of the root cortex. In return, the plant provides carbon in the form of sugars and lipids.

Interaction analysis

The team analyzed the interaction between *Rhizophagus irregularis* and the model legume *Lotus japonicus* Scientists

investigated small RNA molecules present in a cellular complex called AGO1, linked to gene silencing. The analysis revealed RNA molecules originating from the fungus inside the plant cells.

These small RNAs act on the host plant's genetic regulation system. The process alters the expression of plant genes. This change favors the establishment of mycorrhizae and expands root colonization.

The authors indicate that RNA communication between organisms functions as a novel regulatory mechanism for mycorrhizal symbiosis. This finding broadens the understanding of interactions between plants and soil fungi.

Knowledge can guide strategies aimed at sustainable agriculture. Arbuscular mycorrhizae increase nutrient absorption and reduce dependence on mineral fertilizers.

More information at
doi.org/10.1038/s41477-026-02247-2

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Parasitoid mite alters the development of the potato tuber moth.

Volatile compounds from *Pyemotes zhonghuaia* elicit responses consistent with the concept of "fear ecology".

11.03.2026 | 14:55 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: David Jones, University of Georgia

The presence of the parasitoid mite *Pyemotes zhonghuajia* alters development, longevity and reproduction of the potato tuber moth (*Phthorimaea operculella*). Results indicate non-consumptive effects mediated by volatile compounds, within the concept of "fear ecology." This phenomenon opens perspectives for biological control strategies in integrated pest management programs.

Studies have shown accelerated development of the pest when exposed to the parasitoid. The life cycle shortened, with a reduction in longevity. The effect occurred mainly in the larval stage. Exposure also affected reproductive parameters. Females produced fewer eggs.

Analysis by gas chromatography coupled with mass spectrometry (GC-MS) identified 34 volatile compounds emitted by

Pyemotes zhonghuaajia

Electroantennagrams indicated that the moth's antennae responded to most of these substances. Males exhibited greater sensitivity than females.

Bioassays using a Y-type olfactometer evaluated insect behavior in response to the isolated compounds. Females did not show a behavioral response to the volatiles tested. Males showed attraction to decanal, 2-undecanone, nonanal, tetramethylpyrazine, and trimethylpyrazine.

The results indicate a physiological and behavioral adjustment of the pest in response to the risk of parasitism. The

host organism faces a balance between survival and reproduction.

The study indicates potential for *Pyemotes zhonghuaia* in control strategies for the potato tuber moth. Understanding these mechanisms can support sustainable integrated pest management tactics and promote ecological balance in agroecosystems. Further information can be found at doi.org/10.1002/ps.70432

ecology of fear

The term "ecology of fear" was coined by ecologists Joel S. Brown, John W. Laundré, and James Gurung in the late 1990s.

The concept serves to convey the idea of how the mere presence of a predator alters the behavior of its prey, generating impacts throughout the ecosystem.

Animals don't just respond to the death of their own kind. They respond to fear. The presence of a predator causes prey to alter where they move, what they eat, when they go out to feed, and how they interact socially. This chronic stress has profound physiological and ecological costs.

The most studied example involves the reintroduction of wolves to Yellowstone National Park in the United States in 1995. Elk, without predators, grazed freely on riverbanks, destroying riparian vegetation. With the return of the wolves, something curious happened: even without a drastic reduction in the number of elk, they

avoided the valleys and riverbanks—places where they would be vulnerable. This allowed willows, poplars, and other plants to recover to some extent, which attracted beavers, birds, and fish. The wolves changed the geography of fear, and the ecosystem responded.

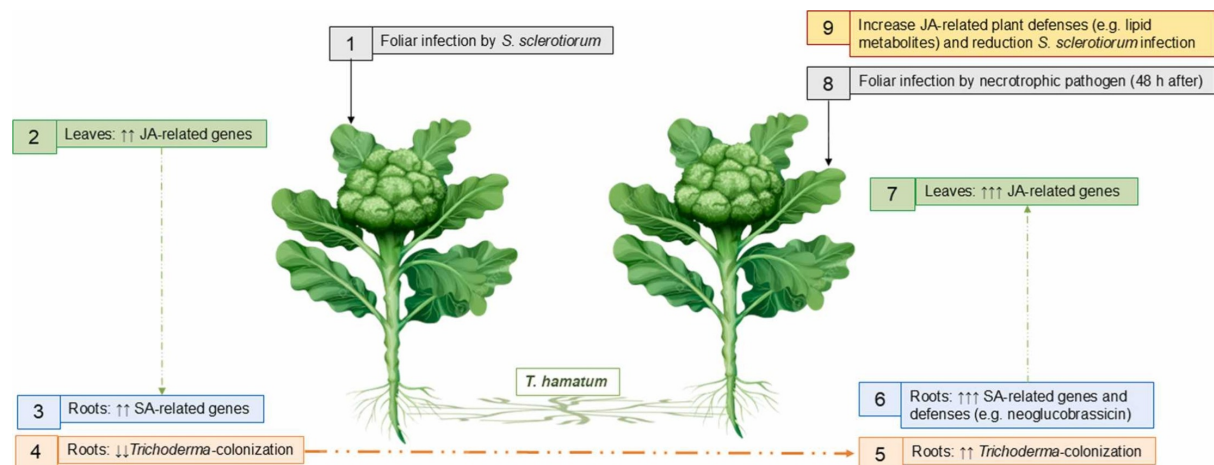
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Fungi in the roots activate defense mechanisms among broccoli plants.

Study shows that *Trichoderma hamatum* transmits warning signals between neighboring plants and reduces damage from *Sclerotinia sclerotiorum*.

11.03.2026 | 13:53 (UTC -3)

Schubert Peter, Cultivar Magazine



Researchers have described a communication mechanism between broccoli plants mediated by an endophytic

fungus. *Trichoderma hamatum* They show that a plant's leaf infection by Sclerotinia sclerotiorum triggered defense responses in a neighboring plant connected by fungal hyphae in the roots. This effect appeared only in the presence of *Trichoderma hamatum*.

The study used an axenic system with two plants. The arrangement allowed control of the hyphal connection between the roots and measurement of colonization, gene expression, and metabolic profile in roots, leaves, and mycelium. According to the authors, the recipient plant gained protection against the necrotrophic pathogen, with reduced leaf lesions, greater tissue vitality, and less oxidative damage.

In trials with two plants and inoculation of *Trichoderma hamatum* The lesion area decreased to $1,08 \pm 0,48 \text{ cm}^2$ when the neighboring plant had been infected 48 hours prior. In the treatment without this pre-infection, the lesion remained at $7,18 \pm 0,18 \text{ cm}^2$. Without the fungus, the pre-infection of the neighboring plant did not generate a relevant difference between the treatments.

The authors also did not detect significant metabolic changes in the mycelium of *Trichoderma hamatum* among the conditions evaluated. This result indicates that protection between plants depended on root colonization by the fungus, and not on a metabolic reprogramming of the mycelium.

In the recipient plant, the activation of defense mechanisms involved hormonal rebalancing. In the roots, there was an increase in responses associated with salicylic acid. In the leaves, the defense linked to jasmonic acid predominated. Metabolomics also indicated an accumulation of compounds associated with defense, such as neoglucobrassicin in the roots and lipids in the aerial parts.

The authors highlight that the work expands the concept of "wired communication" between plants to non-mycorrhizal endophytic fungi. The study also validates the phenomenon in a crop of agricultural interest. In the group's assessment, the result opens up opportunities to explore fungal connectivity as a tool in the sustainable management of

diseases.

Further information at

doi.org/10.1016/j.plantsci.2026.113104

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AGCO announces new global director of digital and information.

Jena Holtberg-Benge takes the lead to accelerate connected solutions and the use of AI.

11.03.2026 | 10:15 (UTC -3)

Cultivar Magazine, based on information from Rachel Potts



AGCO announced the appointment of Jena Holtberg-Benge as Chief Digital &

Information Officer (CDIO). She will assume the role on March 16, 2026. The company seeks to expand its digital transformation and sustain global growth.

Holtberg-Benge has been with AGCO since 2023. During that time, he led the aftermarket spare parts area. The operation achieved growth through cost discipline and the expansion of digital initiatives based on artificial intelligence for dealers and producers.

In her new role, the executive will lead the company's digital, data, and information technology strategy. The work includes information security and the development of scalable capabilities to support the company's growth plans.

According to AGCO's president, chairman, and CEO, Eric Hansotia, the executive combines experience in the agricultural sector with the ability to integrate technology, operations, and organizational culture to drive results. The executive also highlighted her skill in building teams and leading change in a rapidly evolving artificial intelligence environment.

The new CDIO brings over 20 years of experience in agribusiness-related activities. She has worked in manufacturing, digital solutions, operations, and business development. She has also led technological transformation and core platform modernization programs, with a focus on e-commerce initiatives.

Holtberg-Benge will work at AGCO's global headquarters in Duluth, Georgia, United States. She holds a master's degree in international management from the Thunderbird School of Global Management and a bachelor's degree in international studies from Vassar College.

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Asian soybean rust advances with triple resistance in Paraguay

Study detects reduced sensitivity to DMI, SDHI, and QoI and points to mutations in CYP51, SDH-C, and CYTB.

11.03.2026 | 08:31 (UTC -3)

Schubert Peter, Cultivar Magazine

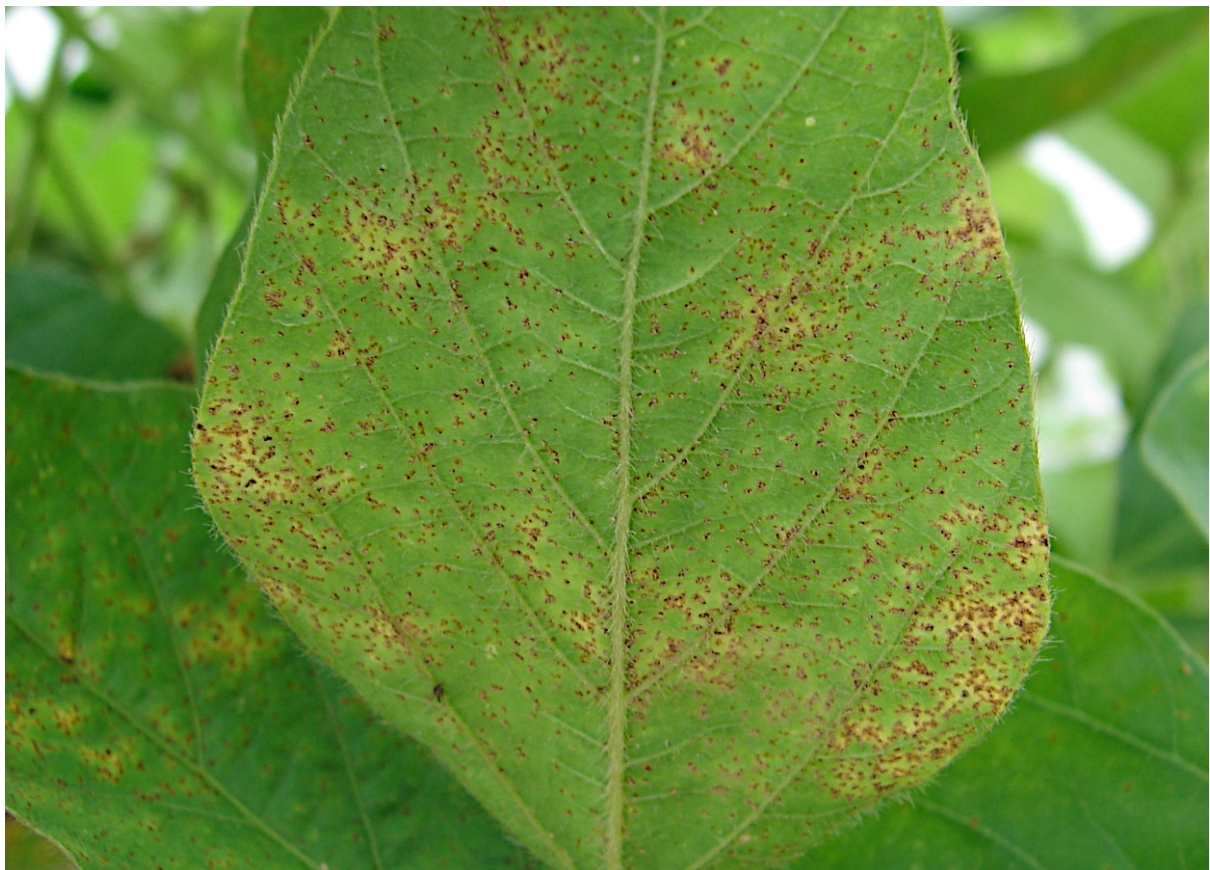


Photo: Tristan Mueller

Asian soybean rust is circulating in Paraguay with multiple fungicide resistance profiles. This finding comes from a study with samples collected in soybean-producing areas in the east of the country. The authors identified reduced sensitivity to active ingredients from the DMI, SDHI, and QoI groups. They also mapped mutations associated with resistance in the CYP51, SDH-C, and CYTB genes.

The study evaluated 20 populations of [Phakopsora pachyrhizi](#) and 18 isolates obtained from a single population, PRP-1. Tests on detached leaves showed that prothioconazole lost effectiveness against Paraguayan populations, even at the highest concentration tested. Fluxapyroxad

and azoxystrobin maintained good control at high doses, but lost performance when the concentration decreased. The 20 populations analyzed exhibited lower sensitivity than susceptible strains used as controls.

Genetic analysis

In the genetic analysis, all Paraguayan populations carried the F120L, V130A, and Y131F mutations in CYP51. The SDH-C gene presented the I86F mutation. The CYTB gene exhibited the F129L mutation at levels close to 100%. According to the authors, this set helps explain the reduced activity of fungicides in soybean areas of Paraguay. The study also did not find significant regional variation in mutation

values, suggesting shared resistance mechanisms among the sampled areas.

Researchers advanced the analysis within a single population. Among 18 PRP-1 isolates, they detected three mutation patterns in CYP51 linked to resistance to DMI: F120L + Y131H; F120L + V130A + Y131F; and F120L + Y131H + I145V. The I86F mutation in SDH-C appeared in 14 of the 18 isolates. The F129L mutation in CYTB appeared in all isolates, with a frequency above 95%. The result reveals strong genetic and phenotypic variability even within a single plot.

The study also compared genomic DNA and cDNA. Mutations in CYP51 appeared with two to three times higher expression in cDNA. This data reinforces the

importance of this gene in resistance to AMD. In SDH-C, mutation values ??changed little between gDNA and cDNA. For CYTB, the high frequency of the mutation in gDNA already indicated strong selection pressure.

Selected isolates

In bioassays with selected isolates, prothioconazole better controlled strains with the F120L + Y131H mutation. The combinations F120L + V130A + Y131F and F120L + Y131H + I145V reduced the active ingredient's activity more significantly. Metconazole showed the opposite behavior. It better controlled isolates with F120L + V130A + Y131F and lost activity against F120L + Y131H and

F120L + Y131H + I145V. According to the authors, this difference indicates distinct binding patterns at the target.

Molecular dynamics simulations reinforced this interpretation. In the wild type and the F120L + Y131H pattern, prothioconazole-desthio maintained a network of interactions between protein, water, and ligand. This network favored the coordination of the molecule. The F120L + V130A + Y131F pattern lost this network. The F120L + Y131H + I145V pattern showed the most unstable condition among the simulated arrangements. The authors point out that the I145V mutation increases the threat to chemical control with DMI, even without direct contact with the ligand.

According to the study, this is the first report of multiple resistance to DMI, SDHI, and QoI in soybean production areas in Paraguay. The authors advocate continuous molecular surveillance, strategic adjustment of applications, and integration of this information into the management of Asian soybean rust. The work also highlights the regional relevance of the topic.

Further information at
doi.org/10.1002/ps.70434

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The nematode *Pratylenchus hippeastri* has been recorded in Brazil.

Detection occurred in orchards in Paraná and Rio Grande do Sul.

10.03.2026 | 15:29 (UTC -3)

Schubert Peter, Cultivar Magazine



doi.org/10.1002/ndr2.70111

Researchers have recorded the root-lesion nematode in Brazil for the first time.

Pratylenchus hippeastri infecting apple and grape trees. Detection occurred in commercial orchards in Paraná and Rio Grande do Sul after collecting roots and soil samples to investigate symptoms of reduced plant growth.

The samples came from apple trees (*Malus domestica*) cv. Gala in a commercial orchard in the municipality of Palmas. Also of grapevines (*Vitis vinifera*) cv. Viognier grafted onto Paulsen rootstock in Pinto Bandeira. In the vineyard, plants showed yellowing, leaf senescence, and root lesions.

Nematodes were extracted by centrifugal flotation from soil and roots. Examination

revealed specimens of the genus *Pratylenchus* associated with both hosts.

Morphological identification was performed using adult females recovered from the samples. The individuals presented two labial annulations, lateral fields with four incisures, and a conical tail with a rounded apex. The morphometric measurements obtained in the apple and grape populations coincided with published descriptions for *Pratylenchus hippeastri*.

Confirmation was achieved through molecular analysis. Researchers sequenced the D2/D3 segments of the 28S rDNA and applied DNA barcoding. The sequences deposited in GenBank showed 100% identity with the xs01 isolate of *Pratylenchus hippeastri* Under BLAST

analysis.

Phylogenetic analysis grouped the Brazilian populations with other sequences of the species with 100% bootstrap support, reinforcing the identification.

The discovery was made in the work of researchers Arlei Maceda, Mara S. Gustmann, Larissa B. Caixeta, Camilla M. Oliveira, Rosemeri T. Silva, Caroline W. Guterres, and Claudio MG Oliveira.

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Eggs from three fruit flies attract females and increase egg laying.

Study identifies volatile compounds in eggs of *Bactrocera dorsalis*, *Zeugodacus cucurbitae*, and *Zeugodacus tau*.

10.03.2026 | 08:30 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: Scott Bauer, USDA

Eggs of *Bactrocera dorsalis*, *Zeugodacus cucurbitae* e *Zeugodacus tau* These substances function as attraction signals for females and stimulate new egg laying. Researchers indicate that these three species do not use oviposition deterrent pheromones, common in other tephritids. Instead, they use attractive compounds that favor aggregation and egg laying.

In the tests, *Bactrocera dorsalis* responded more strongly to stimuli coming from the eggs. Females of *Bactrocera dorsalis* They were attracted to eggs of their own species in 39,33% of cases and to eggs of other species in 28,67%. *Zeugodacus cucurbitae* within six hours. *Zeugodacus tau* showed the lowest overall response to volatile stimuli. The study describes a behavioral

hierarchy. *Bactrocera dorsalis* leads. *Zeugodacus cucurbitae* It occupies an intermediate position. *Zeugodacus tau* It appears in the last track.

Oviposition trials

Oviposition trials reinforced this pattern. Eggs of *Bactrocera dorsalis* They induced females of the same species to produce 2.973,50 eggs in six hours. They also increased egg laying of *Zeugodacus cucurbitae* for 307,33 eggs and of *Zeugodacus tau* for 127 eggs. Eggs of *Zeugodacus tau* also provoked a strong response in *Bactrocera dorsalis*, with 3.613,83 eggs in the same period.

In the chemical analysis, the researchers identified 159 volatile compounds. The eggs of *Bactrocera dorsalis* They gathered 131 compounds. The number exceeded *Zeugodacus cucurbitae*, with 87, and *Zeugodacus tau*, with 93. Among the three species, 58 compounds appeared in common. *Bactrocera dorsalis* It contained 57 unique compounds. This data may help explain its stronger effect on aggregation and egg laying.

For management purposes, the authors point to the potential use of these volatiles in the development of monitoring systems and oviposition attractants. The work also suggests advancements in synthetic baits, prioritizing compounds present in the eggs of... *Bactrocera dorsalis*.

More information at
doi.org/10.3390/insects17030266

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Research highlights the effectiveness of spinosad in stored sorghum.

This study compared four grain protectants against *Rhyzopertha dominica* and *Sitophilus oryzae*.

10.03.2026 | 08:08 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: Joseph Berger

Spinosad showed the best results in controlling pests in sorghum stored for up to 28 weeks, according to a study conducted in the United States. In the study, the active ingredient achieved 100% mortality of adult pests. *Rhyzopertha dominica* in all periods analyzed. In *sitophilus oryzae* Mortality ranged between 30% and 39%, confirming a poor response of this species to post-harvest chemical treatment.

The study compared four commercial formulations applied to sorghum: methoprene, pyrethrins, deltamethrin + methoprene + piperonyl butoxide, and spinosad. Evaluations measured adult mortality after seven days, as well as progeny and percentage of damaged grains eight weeks after artificial

infestation.

To *Rhyzopertha dominica* The deltamethrin + methoprene + piperonyl butoxide mixture also showed relevant suppression, with a reduction in offspring and grain damage. Methoprene alone exhibited low adult mortality, below 14%, a pattern consistent with its mode of action as a growth regulator. Even so, the active ingredient reduced the offspring of... *Rhyzopertha dominica* but it had little effect on *sitophilus oryzae*.

Pyrethrins showed low mortality compared to other treatments. Even so, the treated sorghum had fewer offspring and damaged grains than the control in some of the evaluations. In *sitophilus oryzae* No treatment completely suppressed the

emergence of progeny throughout the experiment. Even so, spinosad maintained the lowest relative levels among the products tested.

For management purposes, the study highlights two points. The first involves the biology of the species. *Rhyzopertha dominica* It lays eggs on the surface of the grain. *sitophilus oryzae* The oviposit occurs inside the grain. This difference helps explain the distinct response to treatments, especially growth regulators. The second point involves water in the grain. The moisture content of the sorghum dropped from 13,3% to 9,9% in 28 weeks. According to the authors, this reduction may have impaired egg viability, delayed development, and increased mortality of immature forms.

Further information at
doi.org/10.3390/insects17030273

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Embrapa advances with algae-based biostimulant for drought.

Greenhouse tests indicate increased silique formation in canola and root growth in wheat.

10.03.2026 | 08:00 (UTC -3)

Cultivar Magazine, based on information from Cristiane Vasconcelos

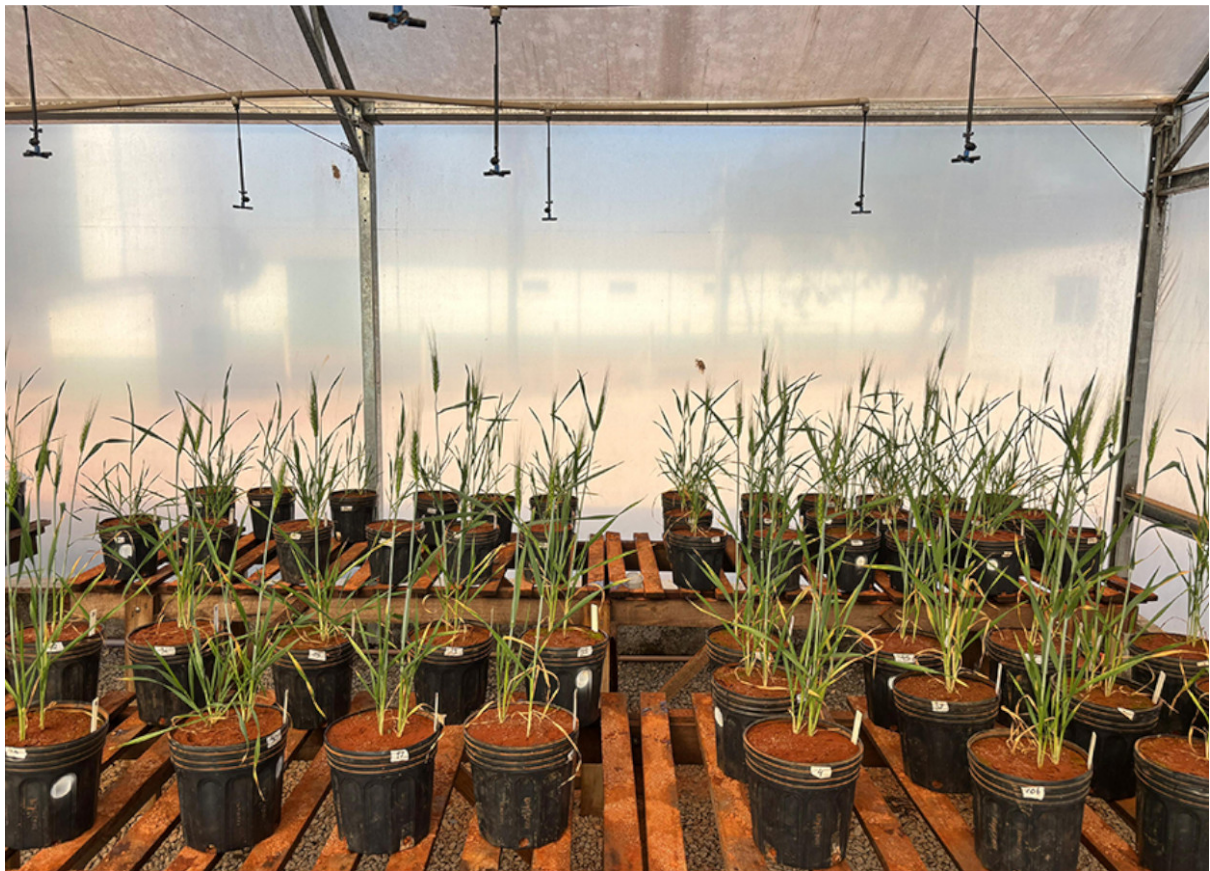


Photo: Agnaldo Chaves

Researchers at Embrapa Agroenergia evaluated seaweed extracts from the Brazilian coast to develop a biostimulant aimed at increasing crop tolerance to water deficit. In greenhouse tests with wheat and canola grown in the Cerrado region, the trials recorded an increase of up to 160% in silique formation in canola and root growth of 10% to 12% in wheat.

The results still require field validation. The team completed the laboratory and greenhouse cycle in January 2026. Now, the project seeks to renew the partnership to conduct experiments under real-world growing conditions. The next step includes dosage recommendations and application periods.

Four types of algae

The research began with four types of seaweed. Over two years, researchers studied drying and extraction methods to preserve secondary metabolites with biostimulant action. Three algae were selected for further study. The tests identified two extracts with potential for use in winter crops in the Cerrado region.

In canola, one of the formulations brought forward flowering and sustained good performance under water restriction.

According to Embrapa, plants treated with a commercial reference product did not show significant gains in the same trial. In upland wheat, one formulation increased root volume and length. The team

associates this effect with a greater capacity to withstand periods without rain.

Commercial crops

Researchers caution that the percentages obtained in greenhouses may not be replicated to the same extent in commercial crops. Even so, the team sees potential for replicating some of these gains in the field. Validation will first need to be carried out in experimental areas and then in the fields of producers in different regions.

In addition to the biological response, the project focused on the conservation of the bio-input. The team developed a dry extract, in wettable powder form, using a spray dryer. The process achieved yields

of up to 80% and a final product with 1,5% moisture, a condition that favors stability and transport.

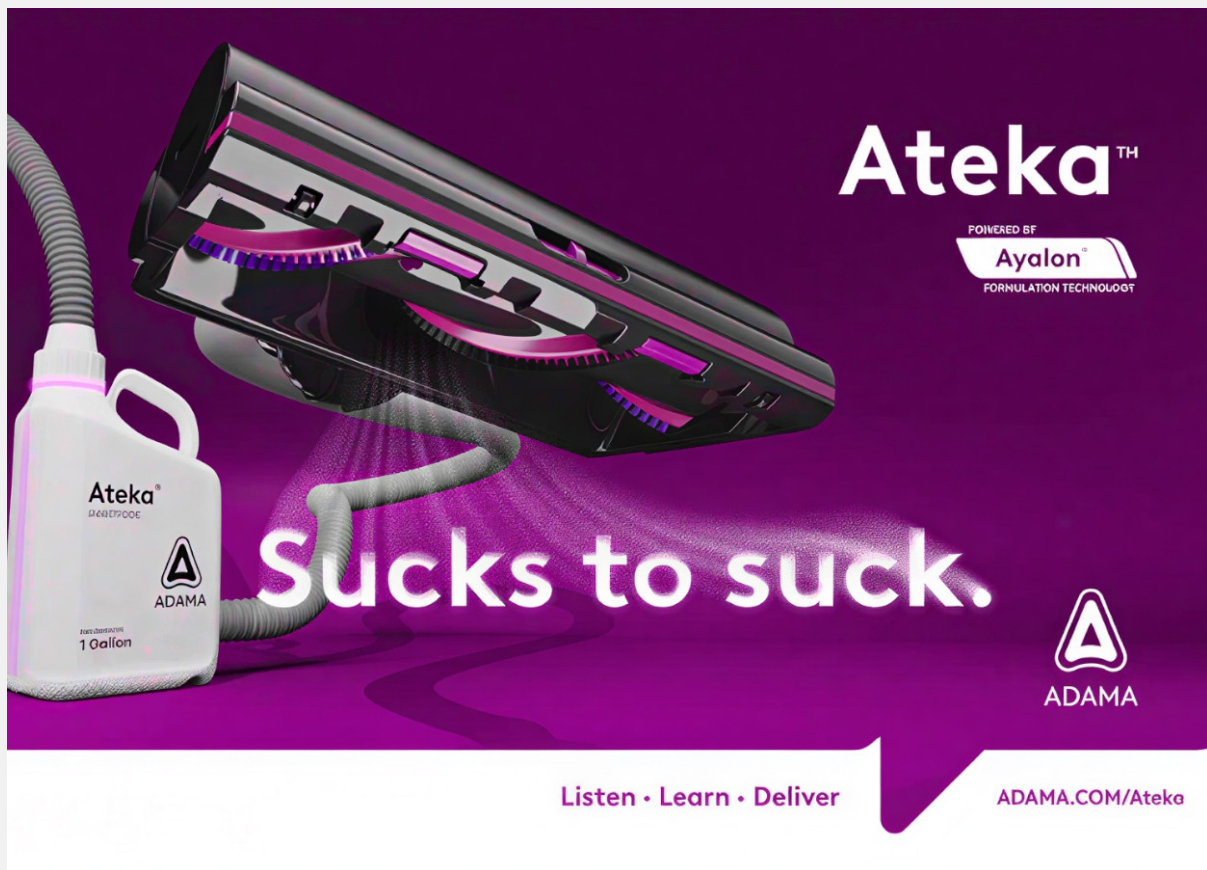
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Adama launches Ateka insecticide in the United States.

Product with spirotetramat and Ayalon technology expands the company's portfolio.

09.03.2026 | 11:02 (UTC -3)

Cultivar Magazine



Ateka™

POWERED BY
Ayalon™
FORMULATION TECHNOLOGY

Sucks to suck.

ADAMA

Listen • Learn • Deliver

ADAMA.COM/Ateka

Adama announced the launch of the insecticide Ateka in the United States

market. The systemic product targets fruit and vegetable producers and seeks to expand control of sucking pests in various crops.

The formulation combines a high concentration of the active ingredient spirotetramat and "Ayalon Formulation Technology." According to the company, this combination promotes greater penetration into the leaves and absorption by the plants.

The insecticide has been registered for use in crops such as citrus fruits, pome fruits, stone fruits, grapes, leafy vegetables, and fruiting vegetables. The product is effective against aphids, psyllids, mites, mealybugs, thrips, leaf miners, mealybugs, and whiteflies.

The concentrated suspension formulation promotes faster absorption by the plant.

The insecticide circulates through both the xylem and phloem, reaching new tissues and roots.

After absorption, the active ingredient interferes with lipid biosynthesis in immature insects. This process prevents molting and reduces egg viability in females.

Control occurs when insects feed on the treated tissues. Early or preventative applications tend to deliver more consistent results.

The high concentration of the active ingredient per drop accelerates penetration and reduces losses due to rain or environmental factors. The formulation

also allows for smaller doses and less handling compared to market alternatives.

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Nezara bed bug trap with UV and blue light enhances capture.

Field experiment shows up to three times increase.

09.03.2026 | 10:29 (UTC -3)

Schubert Peter, Cultivar Magazine



Light traps that combine ultraviolet (UV) and blue light capture more bed bugs of

this genus. *nezara* that traps with isolated UV. Field experiments recorded up to three times more insects captured with the spectral combination. The result indicates potential to improve the monitoring and management of stink bugs in crops.

Researchers evaluated different combinations of LEDs in traps installed near soybean fields in Japan. The tests included UV combined with blue, green, orange, and red. Traps with UV and blue captured significantly more individuals of Nezara viridula. Traps with UV and green light also increased the number of catches, although without a consistent statistical difference in all cases. Combinations with orange or red did not increase attraction.

Light sources

The study also compared three light sources: isolated UV, isolated blue, and the UV-blue combination. The trap with UV and blue captured 8,6 times more *Nezara viridula* than the trap only had blue. The same pattern occurred for *Nezara antennata*. In this case, the combination captured 3,2 times more insects than UV alone and 6,3 times more than blue alone.

The data indicate a synergistic effect between wavelengths. Isolated blue light showed low attractiveness. However, when combined with UV, it amplified the phototactic response of the bed bugs. The phenomenon suggests an interaction between different photoreceptors in the

insect.

Researchers used traps with 42 LEDs. The light sources included UV between 396 and 400 nm and blue light around 469 nm. The experiments took place in two agricultural regions of Japan. The traps remained on between 6 PM and 18 AM. Captured insects were counted periodically throughout the growing season.

Other insects

In addition to the Nezara stink bugs, the tests recorded other agricultural insects. The moth *Pleuroptya ruralis* Beetles of the genus showed greater capture in traps with UV and green light. *Anomalous* They responded primarily to UV light, with no

clear difference between spectral combinations.

Bed bugs of the genus *nezara* They cause losses in various crops. Light traps help in population monitoring. Many traditional systems use incandescent or mercury lamps. The replacement with LEDs is growing due to energy efficiency and longer lifespan.

More information at
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